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All About Sugars

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sugar...

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Back in the "old days" there probably was a 100-lb cloth sugar sack sitting in the pantry. Sweetening hardly ever came into the house except in that big cloth sack, and your mother made sure she had a full one before canning season.

It's not that simple anymore. Sugar has come out of the pantry to a pretty, easy-to-reach canister on the kitchen counter. Sugar also comes into your house in almost every food product you buy. Sometimes our sugar consumption starts to bother us; are we consuming too much?

Actually, there are over 100 substances that chemists classify as sugar. Along with starches and fiber, all sugars belong to a nutrient group called carbohydrates.

If you are an average U.S. citizen, you consume an awesome 130 lb of sugar each year. Sugar and other sweeteners enter your diet from three different sources: (1) in home prepared foods, (2) in products manufactured by the food processing industry, or (3) scooped from the sugar bowl at the table. That's only **added** sugar. In addition, sugar is in many foods such as fruits and milk.

Only 50 years ago, about two thirds of the sugar sold in the U.S. was purchased for home use. This meant that the cook had most of the control over the amount of sugar you and the rest of the family consumed.

Today there's been a complete turn-around; the food processing industry now uses about two thirds of all sugar sold in the U.S. This means that you have lost control over the amount of sugar you and your family eat.

Sucrose (table sugar) is still the most commonly used sugar. The use of corn syrup is increasing, especially in food processing. All other sweeteners are used by Americans only in small amounts.

The biggest consumers of sugars and sweeteners are men. Adult males over 35 consume the most, followed by teenage males, 9- to 11-year-olds, and finally the 20-35 age group. Women over 35 are the lowest consumers of sugars and sugar-containing foods.

Children get most of their sugar from candy. However, teenagers and young adults consume most of their sugar in soft drinks. In fact, much of the increased use of sugar in the U.S. is due to the great increase in the soft drink industry.

What is a sugar?

There are plenty of natural sugars. They occur in milk, fruits, vegetables, and grains. The main function of sugars (and all carbohydrates) is to provide energy to the body.

Energy does, indeed, "keep us going." It is necessary for good health, growth, and proper body function and activity.

The natural sugars supply energy, but the foods in which they occur also give us valuable amounts of vitamins, minerals, protein, and fiber. Sugars by themselves, and foods to which large amounts of sugar have been added, are mainly empty calorie foods. This means that they add many calories to your diet but do not provide the added bonus of other nutrients.

The more common sugars in food are glucose, fructose, lactose, maltose, and sucrose. Glucose (also called dextrose just to confuse you) is widely distributed in foods. Fructose (levulose) is found naturally in fruits, and therefore is referred to as fruit sugar. Lactose is the sugar which occurs naturally in milk; maltose (malt sugar) occurs in grains and other starches. Sucrose (table sugar) comes from sugar beets or sugar cane. Brown sugar and powdered sugar are different forms of sucrose.

Some supermarkets will also carry turbinado sugar. Turbinado sugar is a partially refined sugar erroneously called raw sugar.

Syrups, honey, and molasses are sweeteners that contain highly concentrated amounts of sugars. Ounce for ounce, these sweeteners have approximately the same number of calories as table sugar. Honey and molasses are said to contain nutrients that are missing from table sugar, and are advertised as being more nutritious.

This statement is just barely true. There **are** more nutrients in honey and molasses than in pure sugar, which has none. But "hardly any" will total more than "nothing." The nutrients in honey and molasses are insignificant.

All sugars and sweeteners contain many calories and **no** significant amounts of any nutrients. Perhaps the advantage of honey and molasses over table sugar is their strong flavor. Because we aren't accustomed to it, we **may** use less sweetener and save a few (very few) calories until we learn to like the taste.

So far, we've talked about simple carbohydrates—the sugars. There is another whole class called the complex carbohydrates. In this class are starch and fiber.

Starch is a "really big" sugar. There are just three simple sugars—fructose, glucose, and galactose. Each contains the exact same ingredients—carbon, hydrogen, and oxygen. The only difference is in the way the carbons are connected to each other. Sucrose is a duo of fructose and glucose. Starch is a truly gigantic string of glucose molecules.

Starch and fiber are found in foods that originate from plants. They include breads, cereals, pastas, rice, fruits and vegetables, beans, lentils, and nuts. In our bodies, starch must be broken down into glucose before it can be absorbed into our system. Fiber cannot be broken down, so it contributes no nutrients.

Well, if starch will be absorbed as glucose, what difference does it make whether we eat sugar or starch?

You must judge a carbohydrate by the company it keeps.

Foods that contain starch also contain important vitamins and minerals and often contain fiber too. Starchy foods are often not "empty calories" (energy but no other nutrients). Refined and processed sugar supplies only energy; starch and natural sugars usually bring along vitamins and minerals.

Sugar and your health

We need carbohydrates; they are necessary as a continuous energy supply for growth, physical activity, and functions such as heart beat and breathing. In addition, important body parts, such as the brain and nerves, prefer to obtain their energy from glucose.

If you think you can cut back severely on your daily carbohydrate intake and burn up fat to supply energy, think again. You may lose weight, but you will lose your health, too.

Fat, whether supplied by body tissues or food, does supply energy. That energy from fat can be used by most muscles, but **not** by the brain, an organ we really can't get along without.

Likewise, if you cut way back on your carbohydrate intake and substitute protein as an energy source, the protein **can** be turned into energy. But the conversion ratio isn't very good. If your brain needs 3 grams of glucose, your body will have to break down 15 grams of protein. If not from the diet, it takes that protein from the muscles. Remember that the heart is a rather necessary muscle.

Oddly enough, you also need carbohydrate in your diet to fully digest fats.

A daily supply of carbohydrate is essential. The body stores only small amounts of carbohydrate, mostly in the liver and muscles. There is no exact amount of carbohydrates needed daily. However, nutritionists suggest that 50% or more of our daily calories come from carbohydrates.

Daily calorie intake (or the energy you need to get through the day) is different for each individual because of differences in age, sex, and physical activity levels.

What becomes of sugar in your body?

The simple sugars (glucose, fructose, galactose) are chemically so "simple" they can go directly through the intestinal wall. But sucrose is just a bit more complicated. While it is still in the digestive tract, it is broken down into glucose and fructose, each of which can be absorbed separately, fructose more slowly than glucose.

Once the fructose is absorbed it is carried through the blood directly to the liver. Here much of the fructose is converted to glucose and then sent into the general circulatory system. Ultimately, much of the fructose is used as glucose.

The final fate of all these sugars is conversion to energy. This energy is used immediately by body cells, converted to a storage form called glycogen, or converted to fat for longer-term storage in fat tissue.

How to get back in control

The awareness that sugar is creeping into your house without your knowledge or even approval is the first step. It might be a very enlightening exercise to examine the labels of the food you buy any certain day.

What you may find is a confusing array of strange words. A clue is to search for words ending in -ose. That's a giveaway for sugar.

Then you can take some steps to cut down on sugars and sweeteners and make your diet more nutritious.

Avoid or limit highly sugared foods and beverages such as soft drinks, jams, jellies, candies, syrups, ice cream, and rich bakery goods.

Use less of all forms of sugars and sweeteners if you have the chance—less white sugar, powdered sugar, honey. Hide the sugar bowl if you have to, or pull a long face and ask the family to help "stretch" the little dab you leave in it.

Substitute unsweetened fruit juices, milk, or water for soft drinks, punches, fruit drinks, and ades which are highly sugared. Drink coffee and tea without sugar.

Use fresh fruits when they are in season. Use fruits canned in their own juices or in light syrups instead of fruits in heavy syrup.

Buy ready-to-eat cereals that are low in sugar. Sweeten them with fresh fruit or dried fruit instead of sugar.

Check the food labels for sweeteners and sugars. Remember that the ingredients that are listed first are present in the largest amount by weight.

When cooking or baking at home, use one fourth to one half less sugar than the recipe calls for. You won't notice the difference in some recipes, but in some cookie and cake recipes you will find the products have a different texture. You'll just have to experiment. That's the time to have fun and be creative.

Serve cakes without frosting.

Replace highly sugared foods and beverages with complex carbohydrates like fresh fruits and vegetables, grain products, nuts, and dried peas and beans. This replaces empty calories with foods rich in many of the nutrients necessary for good health and proper growth.

Change your shopping habits. If empty-calorie foods aren't in the refrigerator or kitchen cabinet, they can't be eaten.

Don't reward or bribe children with sweet foods. Reward their good behavior by spending some time with them.

Splurge by buying a cookbook that features new and interesting ways to prepare fruits, vegetables, beans, and grains.

Don't replace sugars with high-fat foods or alcoholic beverages.

Try your hand at home processing of fruits. That helps you control the sugar, for you may choose to can or freeze in fruit juice, light syrup, or water. And some fruits, such as applesauce, can be processed with no sugar at all.

Look for these words on foods you buy. They are all sugars.

—words ending in "-ose"
—honey (fructose and glucose)
—brown sugar (white sugar coated with molasses)
—corn syrup
—maple sugar, syrup
—invert sugar
—high fructose corn syrup
—liquid sugar
—molasses

Understanding carbohydrate labeling helps you decide how high the content of sugar is in the foods you buy. To make sense of carbohydrate labeling, you must know that:

—Carbohydrate includes starch, sugars, and fiber.
—Of the carbohydrates, only starch and sugar provide calories.
—There are 28 grams in one ounce.
—One gram of carbohydrate contains four calories (except fiber).
—One teaspoon of sugar contains 16 calories (4 grams).

Sugar substitutes

There are many sugar substitutes marketed today. Here are some of the more common ones.

Aspartame. The newest approved sweetener, 200 times sweeter than sugar. Contains phenylalanine and aspartic acid and is digested as a protein. Excellent sweetener with no aftertaste, but not as stable as saccharin in some foods. Recently approved for soft drinks. Should not be used by persons with PKU (phenylketonuria). (Common brand name is Nutra-Sweet).

Saccharin. Used around the world since the turn of the century; 300 times sweeter than sugar (sucrose). Very stable in foods, imparts an aftertaste. Congress has prevented an FDA ban until at least 1985. Do not confuse with cyclamate, which is banned in the U.S.

High fructose corn syrup (HFCS). Mixture of glucose and fructose from corn starch. Principal attraction is reduced cost of sweetening food.

Sorbitol and mannitol. Sugar alcohols made by hydrogenating glucose and invert sugar. Only half as sweet as sucrose. Substituted in foods for people on restricted sugar diets. May have laxative effects at high levels.

Xylitol. Sugar alcohol present in some fruits and vegetables and cellulose byproducts. Same sweetness as sucrose. Used in chewing gum.

It takes some getting used to

Regard it as a challenge. Cutting back on sweets may not be easy.

Americans have a sweet tooth. In fact, some of us have a whole mouthful of 30-plus sweet teeth. (Subject, of course, to victimization by the very sweets they crave.) It may take some time to get used to foods that aren't so sweet; however, we can easily learn to enjoy the natural sweetness of fruits mixed with the nut-like flavor of whole grain in cereals and bread products.

Natural food flavors have been masked with excessive sweetness long enough.

Sugar by the teaspoon

The following table gives the approximate sugar content of some favorite foods. The sugar is given in teaspoons (one teaspoon = 16 calories).

		Tsp. sugar
Candy		
Chocolate bar	1½ oz	1-2
Chocolate fudge	1½" sq	4
Chocolate mints	1 medium (20 to 1 lb)	3
Marshmallow	1 average (60 to 1 lb)	1½
Chewing gum	1 stick	½
Cakes and cookies		
Chocolate cake	1/12 cake (2 layer iced)	15
Angel food cake	1/12 of large cake	6
Sponge cake	1/10 of average cake	6
Doughnut, plain	3" diameter	4
Gingersnaps	1 medium	1
Molasses cookies	3½" diameter	2
Brownies	2"x2" x¼"	3
Ice cream		
Ice cream	1/8 quart (½ cup)	5-6
Sherbet	1/8 quart (½ cup)	6-8
Pie		
Apple	1/6 med. pie	12
Cherry	1/6 med. pie	14
Raisin	1/6 med. pie	13
Pumpkin	1/6 med. pie	10
Soft drinks		
Sweet carbonated beverage	1 can (12 oz)	7-9
Milk drinks		
Chocolate	1 cup, 5 oz. milk	6
Cocoa	1 cup, 5 oz. milk	4
Eggnog	1 glass, 8 oz. milk	4½

		Tsp. sugar
Spreads and sauces		
Jam	1 level tbs.	3
Jelly	1 level tbs.	2½
Marmalade	1 level tbs	3
Syrup, maple	1 level tbs	2½
Honey	1 level tbs	3
Chocolate sauce (thick)	1 tbs	4½
Cooked fruits		
Peaches, canned in syrup	2 halves, 1 tbs. syrup	3½
Rhubarb, stewed, sweetened	½ cup	8
Applesauce (unsweetened)	½ cup, scant	2
Prunes, stewed, sweetened	4 to 5 med, 2 tbs. juice	8
Dried fruits		
Apricots, dried	4 to 6 halves	4
Prunes, dried	3 to 4 medium	4
Dates, dried	3 to 4 stoned	4½
Figs, dried	1½ to 2 small	4
Raisins	¼ cup	4
Fruits and fruit juices		
Fruit cocktail	½ cup, scant	5
Orange juice	½ cup, scant	2
Pineapple juice, unsweetened	½ cup, scant	2 3/5
Grapefruit juice, unsweetened	½ cup, scant	2 1/5
Grapefruit	½ cup, scant	3 2/3

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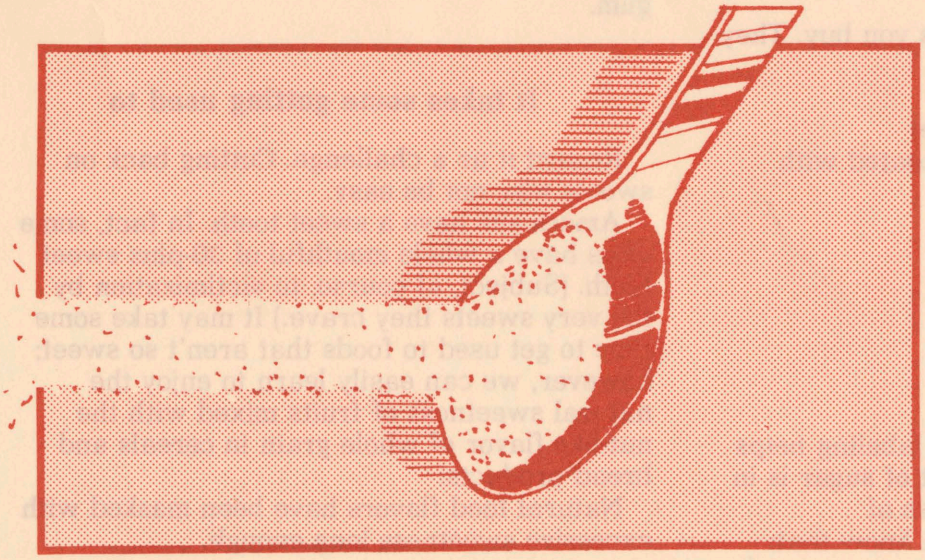

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